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Region 8

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Upper Animas Mining District

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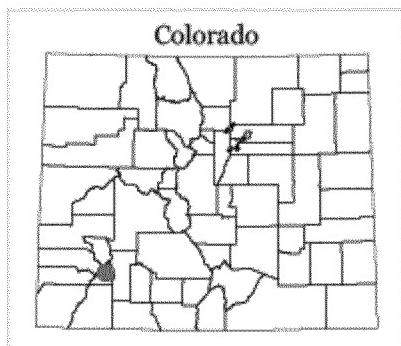
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Site Type: Non NPL
City: Silverton
County: San Juan
Street Address:
ZIP Code: 81433
EPA ID: 085M
SSID: CO0001411347
Site Aliases: Upper Animas Watershed, Upper Cement Creek
Congressional District: 3

What's New?

Updated August 2015

On August 5, an EPA team working to investigate and address contamination at the Gold King Mine in San Juan County, Colo. unexpectedly triggered a large release of mine waste water into the upper portions of Cement Creek. For more information and current updates, visit the [Gold King Mine Release](#) page.

In 2015, EPA's Superfund Remedial program is continuing field investigations at the Upper Animas Mining District site. These investigations include collecting surface water samples during high-flow conditions in June as well as surface water and sediment samples during low-flow conditions in September/October. Both water and sediment samples will be tested for a range of contaminants including heavy metals associated with historic mining activities. EPA also plans to sample mine waste areas in the upper reaches of the Upper Animas River (UA) watershed and the tailings along the UA between Howardsville and Eureka upstream of Silverton in early August.

On June 23, 2015, EPA met with the Silverton Town Board and San Juan County Commissioners to discuss a number of site-related issues including the possible sampling of community soils. During the meeting, EPA discussed historical information about smelting operations in or near town (see [smelter map](#)). EPA also discussed very limited residential soil sampling conducted by the state on behalf of EPA in 1997 (see [Draft Analytical Results Report](#)) and data from the Rose/Walsh Smelter Brownfields investigation. All of these data offer insights into the potential for elevated levels of heavy metals in or near town, but are insufficient to draw any firm conclusion regarding the issue. EPA also offered options for cleaning up properties, if levels of heavy metals in the soil pose a potential human health concern.

EPA released a draft Baseline Ecological Risk Assessment (BERA) for the portion of the site that includes Upper Cement Creek in April 2015. EPA presented the document and related findings to the community and to the Animas River Stakeholder Group (ARSG) during meetings in Silverton on April 28, 2015.

[Draft Baseline Ecological Risk Assessment and Fact Sheet](#)

EPA's Superfund Removal program will be installing an engineered concrete bulkhead (large plug) in the adit (tunnel) of the Red and Bonita Mine during summer 2015. The bulkhead will help control the ongoing release of contaminated water from the adit.

[Red and Bonita Removal Action Photo Log](#)

[Red and Bonita Bulkhead Construction Fact Sheet](#)

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Site Description

The site study area includes mining-impacted land and surface water in the UA watershed in San Juan County, Colorado, including private, federal and state lands, as well as the town of Silverton. Since investigations are still underway, the areas that comprise the site are still being defined. Initial investigations document elevated levels of hazardous substances (heavy metals) in and around the many former mining sites, as well as in surface water and sediments in the UA. The sources for these heavy metals are both man-made (i.e., mining related) and naturally occurring.

In this area, several calderas (collapsed craters of ancient volcanos) are the remnants of eruptions 27-28 million years ago. During this volcanic activity, many faults developed in the rocks. Mineral-laden water deposited metals, such as gold, silver, lead, zinc and copper, in these faults. These faults became the ore veins that were later mined.

The UA watershed covers approximately 140 square miles of one of the volcanic calderas, the Silverton caldera, which in its natural state is highly mineralized. Active mining in and around

Silverton started around 1870 and ended in 1991. Over 300 former mines have been identified in the area. Mining activities significantly increased the exposure of mineralized geologic materials. This contributes to degraded water quality in the UA and its tributaries. Mine drainage from the former mines and mine-related wastes, such waste rock piles, contribute acidic, metal-rich water to the UA.

Background

EPA and the Colorado Department of Public Health and Environment (CDPHE) conducted a Superfund Site Assessment of the site in the 1990s. This assessment identified the severe impacts to aquatic life in the UA and its tributaries from naturally occurring and mining-related heavy metals. It also acknowledged the community-based collaborative effort that was under way at that time to address those impacts. In recognition of the community-based collaborative effort, EPA agreed to postpone adding all or a portion of the site to the Superfund National Priorities List (NPL), as long as progress was being made to improve the water quality of the Animas River.

In support of the collaborative effort, EPA's Superfund Remedial program has contributed resources for water quality sampling, ecological risk assessment and data analysis. In addition, the Superfund Removal program has contributed resources for the investigation and closure (bulkheading) of the Red and Bonita Mine tunnel.

EPA, through its Ecosystem Protection program, also provides the Colorado Water Quality Division of CDPHE with Nonpoint Source Management program (Section 319) grant funds. ARSG and others have received grants under that program for investigation and cleanup efforts in the watershed.

Until approximately 2005, water quality in the Animas River was improving. However, since 2005, water quality in the Animas River has not improved and, for at least 20 miles below the confluence with Cement Creek, has declined significantly.

Because of this declining water quality in the Animas River, in 2008, EPA's Superfund Site Assessment program began investigations in Upper Cement Creek focused on evaluating whether the Upper Cement Creek area alone would qualify for inclusion on the NPL. This evaluation indicated that the area would qualify, although after receiving additional community input, EPA again postponed efforts to include the area on the NPL. Since that time, EPA has continued and broadened its investigations of conditions at the site in order to understand the major sources of heavy metal contamination in the UA.

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Site Risk

Mining operations have greatly disturbed the land, adding to existing highly mineralized

conditions in many areas of the site. Mineralized waste rock exposed to air and water causes acidic conditions to mobilize the release of heavy metals to the surrounding environment. These heavy metals have found their way into the Animas River and its tributaries and have eventually traveled farther downstream.

Media Affected	Contaminants	Source of Contamination
surface water, subsurface water, surface soils and stream sediments	heavy metals – aluminum, lead, zinc, cadmium, copper, iron and manganese	historic mining activities and naturally occurring mineralization

Results of Recent Investigations

Water sampling showed a marked increase in the levels of several heavy metals in the Animas River below the confluence with Cement Creek after active and passive treatment ceased in the Cement Creek drainage. In addition, an investigator from the U.S. Geological Survey (USGS) presented findings at the ARSG meeting on September 23, 2014, from application of the One-Dimensional Transport with Equilibrium Chemistry (OTEQ) model to the Cement Creek drainage. The modeling effort identified the need for additional information about pollutant loads from sources other than Cement Creek to the Upper Animas River.

Evidence from the 2015 Draft Baseline Ecological Risk Assessment (BERA) indicates that:

- The benthic invertebrate (small organisms that live in or on the bottom sediments of rivers and streams) community is impaired in most sections of the Animas River, Cement Creek and Mineral Creek. Effects are less severe further down the Animas River but are apparent to Bakers Bridge.
- Water in the Animas River from Arrastra Creek to approximately Cement Creek is likely toxic to all trout species, with the exception of brook trout. Brook trout living in this reach, however, are likely stressed much of the year.
- Metals concentrations in the Animas River below Mineral Creek have eliminated virtually all fish down to Elk Creek and all cutthroat and rainbow trout down to Cascade Creek, where only a small community of brook and brown trout exists. Results also predict fish populations are likely impaired down to at least Bakers Bridge.
- It is unlikely that birdlife or mammal populations are experiencing significant negative effects from metals in the Animas River.

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Cleanup Progress

Numerous mine reclamation and mine waste cleanup projects have been completed in the Upper Animas watershed over the last twenty years. Many of these have been voluntary projects undertaken by the ARSG using Section 319 grant monies. Sunnyside Gold Corporation (SGC) also has conducted reclamation activities in the watershed. These efforts have included diverting

runoff away from and capping mine waste piles, moving mine waste piles away from drainages, consolidating mine waste piles and re-vegetating mine waste piles.

Between 2007 and 2009, a cleanup of the Rose Walsh Smelter site was conducted under the Colorado Voluntary Cleanup program using funding from a variety of federal, state and local sources, including the Colorado Department of Local Affairs, EPA Brownfields program, San Juan County, Colorado Department of Transportation and CDPHE. The site, which was contaminated with heavy metals, is now available for redevelopment.

Under the Superfund Removal program, an engineered concrete bulkhead will be installed in the adit of the Red and Bonita Mine during summer 2015. The bulkhead will help control the ongoing release of contaminated water coming out of the adit.

[Red and Bonita Removal Action Photo Log](#)

[Red and Bonita Bulkhead Construction Fact Sheet](#)

[Profile of the Red and Bonita Mine Site from the EPA On-Scene Coordinator](#)

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Community Involvement

Community involvement plays an important role in the Superfund process. EPA uses a number of different tools and resources to promote effective, on-going, meaningful community involvement. The goals of the Superfund community involvement program are to:

- Keep communities affected by sites informed throughout the cleanup process.
- Provide opportunities for communities to comment and offer their input about site cleanup plans.
- Facilitate the resolution of community issues tied to a site.

At this site, the following community involvement activities have taken place:

- EPA, BLM and CDPHE have been active participants in the collaborative efforts of the community and ARSG.
- ASRG hosted an informal meeting on June 20, 2013, in which it, along with federal and state agencies, made presentations covering ARSG activities, surface water sampling results, underground investigations, preliminary aquatic risk assessment results and ideas for potential solutions to improve water quality.
- In September 2014, an open house/availability session was held in Silverton to update the community about site activities, including the Red and Bonita removal action, and to discuss the OTEQ modeling results.
- A [Community Involvement Plan](#) was prepared for the Red and Bonita Removal Action in

January 2015.

- In April 2015, EPA presented the draft BERA to the community and ARSG.

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Next Steps

EPA, BLM, CDPHE, ARSG and Trout Unlimited will be conducting extensive water quality sampling in the Animas River watershed above Silverton in 2015. Plans are to conduct water quality sampling during both high flow (spring) and low flow (fall). They will also conduct sediment sampling at the low-flow event. EPA also plans to conduct sampling of mine waste areas in the upper reaches of the UA watershed and of the tailings along the UA between Howardsville and Eureka upstream of Silverton.

EPA, BLM and CDPHE are also working with SGC on an arrangement for SGC to conduct an investigation of the Mayflower Tailings impoundments and their impacts on the water quality to the Animas River.

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Site Documents

Red and Bonita Mine

[Red and Bonita Removal Action Photo Log, July 24, 2015](#)

[Bulkhead Construction Fact Sheet, May 2015](#)

[Removal Community Involvement Plan, January 2015](#)

[Pollution/Situation Report \(POLREP #1 Initial\), December 2014](#)

[Action Memorandum: Approval and Funding for a Removal Action at the Red and Bonita Mine Site, September 2014](#)

Investigations

[Sampling and Analysis Plan/Quality Assurance Project Plan for 2015 Sampling Events, June 2015](#)

[2014 Sampling Activities Report, May 2015](#)

Draft Baseline Ecological Risk Assessment, Fact Sheet and Presentation, April 2015

Smelter Map, 2015

USGS Professional Paper 1651: Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed, San Juan County, Colorado, 2007

Draft Analytical Results Report, July 1999

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Frequently Asked Questions

Under construction

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